

REMARKS

Reconsideration of this application is respectfully requested in view of the discussion presented herein.

1. Rejection of Claims 1-39 under 35 U.S.C. § 103(a).

Claims 1-39 were rejected as being obvious and unpatentable over Bokor et al. U.S. 6,555,828) in view of the patent issued to Tomii et al. (U.S. 5,940,173). The Applicant has carefully considered the rejection and responds as follows:

The Applicant respectfully submits that subject matter of independent Claims 1, 7, 13, 18, 23, 29, or 35 (as well as the dependent claims) would not have been obvious to a person having ordinary skill in the art in view of the teachings of Bokor et al., in view of Tomii et al., in part, because the combination does not render the invention.

It is not readily apparent to the Applicant how these references could be combined to arrive at Applicant's invention as recited in pending claims. In general, the Bokor apparatus detects reflectance from a very reflective surface and Tomii detects reflection from a light-absorbing surface. Bokor has two types of detectors and Tomii has only one. Nor is there any incentive, suggestion or motivation to exchange the method of detection and "what" is detected from the Bokor patent with the invention disclosed in the Tomii. For example Bokor detects a reflected beam and Tomii does not. Accordingly, Applicant submits that the Bokor and Tomii patents alone or in combination do not disclose a "means for simultaneously imaging multiple points in an area of a mask blank using reflections of light from [an] EUV light source..." and therefore the claims are not obvious in light of the references.

The Bokor patent discloses an apparatus for detecting defects below the surface of a mask substrate that uses a 13 nm light focused on a very small spot on a mask blank and then detecting the intensity of the reflection (bright field), the scattered beam intensity (dark field) and/or the change in the photoemission current. (See the Bokor abstract and Col. 2, lines 55-67). Referring particularly to FIG. 3A of Bokor, the EUV beam is directed from the source 50 through a "glancing incidence optical system having two mirrors 52 and 54 arranged in the Kirkpatrick-Baez (K-B) configuration."

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detected by a channeltron electron multiplier 60 and the scattered photons i.e. dark field measurements are made with a microchannel plate 62. The present invention does not demagnify the EUV beam with mirrors.

In comparison, the Tomii patent discloses an apparatus for inspecting the quality of identification cards and the like that have a transparent protective overlay that has an ultraviolet light absorbing layer. The apparatus directs indiscriminate ultraviolet light at a 350 nm wavelength (versus 13 nm beam in Bokor) on the surface of the cards. Defects are detected in the surface layer adherence of the cards in a method that is incompatible and essentially the opposite of that disclosed in Bokor. At Col. 12, lines 33-40 of Tomii it states: "The intensity of reflected ultraviolet light ...when the transparent protective overlay of card 1 is scanned...shows low values at the locations where the transparent protective overlay is formed properly and thus absorbs ultraviolet light in the transparent protective overlay and high values at the defective areas 8 where the card surface reflects more light, as shown in FIG. 2a." (emphasis added).

Applicant submits that there is no incentive, suggestion or motivation found in either Tomii or Bokor to apply a layer of ultraviolet light absorbing material to the mask blank described in Bokor and look for increases in reflectance of ultraviolet light in the 350 nm range to identify defects. Nor is there any teaching in Tomii with respect to ultraviolet absorbing materials that would be suitable for use with shorter wavelengths and higher intensity extreme ultraviolet light as disclosed in Bokor.

Accordingly, there is no suggestion, incentive or motivation found in Bokor or Tomii to combine the detection methods of Tomii with the extreme ultra violet light production apparatus of Bokor. Applicant submits that the detection methods disclosed in Bokor and Tomii are incompatible and the stated combination does not disclose the invention.

In addition, neither the Bokor nor the Tomii patents disclose a structure or method to "simultaneously image multiple points in an area" as claimed in the independent claims. Although the Tomii patent discloses a CCD, the camera is not measuring the reflection of a beam, rather it is set to receive randomly reflected rays

camera is perpendicular to the surface of the laminated card

to receive a certain frequency of reflected light from the absorbing layer through optical filters 6 and 7 and determine if the overall reflectance exceeds a threshold limit (D_{th}). If the threshold limit of reflected light from the absorptive surface is exceeded, the card is rejected and removed from the apparatus. To achieve this end, the Tomii apparatus uses a low resolution CCD camera. (Col. 13, lines 55-65).

Furthermore, Bokor discloses an apparatus with two different types of detectors (bright and dark) to view a reflected beam and the Tomii patent disclosed one type of detector to detect generalized reflections without a beam. Since there is no beam that is directly reflected and detected in Tomii, the size, intensity and duration of the UV beam are unimportant.

In contrast, the Bokor apparatus illuminates the mask blank with a microscopic spot of EUV light and compares the intensity readings of the reflected beam and scattered rays from the bright field and dark field detectors. The size of the beam and duration of the exposure, for example, are important to the Bokor apparatus and method. At Col. 5, lines 20-24, the scanning time for one embodiment is described. It states: "With a dwell time of 20 μ sec on a 1 μ m spot, it will take 33 minutes to scan a 1 cm by 1 cm area. To detect a 1% fluctuation in the reflected beam with the same signal to noise ratio, the dwell needs to be increased by 25 times." Additionally, the size of the beam in Bokor is demagnified to give a wider reflective field as discussed previously.

The aforementioned differences including different types and number of detectors; reflections from an absorbing surface versus a reflecting surface; the nature of the light beams and reflections, suggest the Tomii and Bokor patents cannot be combined. Furthermore, neither the Tomii and Bokor patents individually or in combination suggest or provide incentive or motivation for "means for simultaneously imaging multiple points in an area of a mask blank using reflections of light from [an] EUV light source" as claimed by the Applicant. Bokor does not disclose a "means for imaging" or a "means for simultaneous imaging multiple points." Nor does Tomii provide a means for "simultaneous imaging of multiple points" using reflections of light

any points, rather the CCD is used to evaluate the level of the total amount of light

received by the camera with a threshold level and the light source is not an EUV light source. Consequently, the combination does not provide an essential limitation to the claims.

In summary, there are a number of shortcomings that arise from a combination of the cited references utilized for supporting an obviousness rejection for the purposes of 35 U.S.C. § 103 of Applicant's claims. In view of the cited references Applicant respectfully submits that since all claims of the invention are not obvious and that all claims should be immediately passed to allowance.

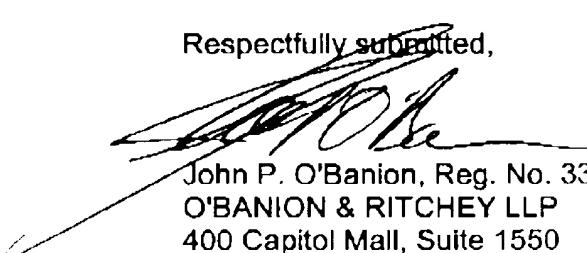
2. Conclusion.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

The Applicant also respectfully requests a telephone interview with the Examiner in the event that there are questions regarding this response, or if the next action on the merits is not an allowance of all pending claims.

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Respectfully submitted,


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